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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,760	03/22/2005	Henk Jan Frans Van Den Abbeele	PR/3-23159/A/RAI 59/PCT	3715

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CIBA SPECIALTY CHEMICALS CORPORATION
PATENT DEPARTMENT
540 WHITE PLAINS RD
P O BOX 2005
TARRYTOWN, NY 10591-9005

EXAMINER	
LOEWE, ROBERT S	

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1796	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/528,760	VAN DEN ABBEELE ET AL.	
	Examiner	Art Unit	
	Robert Loewe	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17,20 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17,20 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/22/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETALIED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, it is unclear as to how at least 90% of the anhydride groups can be reacted to imide groups when less than 0.9 equivalents of an amine source are employed per 1 mole of anhydride groups. For purposes of further examination, the ratios of amine source to anhydride monomer will be interpreted as 0.9-10:1 for instant claim 12 and 1.2-0.9:1 for instant claim 13. Appropriate correction is required.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. A broad limitation and a narrow limitation in the same claim is considered indefinite, since the resulting claims does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in Exparte Wu, 10 USPQ2d 2031, 2033'(Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of Ex

parte Steigewald, 131 USPQ 74 (Bd. App. 1961); Exparte Hall, 83 USPQ 38 (Bd. App. 1948); and Exparte Hasche, 86 USPQ 481 (Bd. App. 1949). See MPEP 2173.05(d). In the instant case, claim 21 recites the both the genus "organic film", and the species "polyethylene film, metal or textile". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 5, 7, 16, 17, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Jannusch (US Pat. 4,440,884).

Claims 1 and 7: Jannusch teaches an aqueous polymer dispersion comprising a copolymer of styrene-maleic anhydride, in which the copolymer is subjected to an imidization reaction whereby greater than 90 mol % of the anhydride monomer units of the copolymer are imidized (5:1-30 as an example). While Jannusch does not explicitly state that the imidization reaction proceeds at greater than 90% conversion, it is the position of the Office that this inherently occurs. Specifically, Jannusch repeatedly employs the phrase "to ensure the reaction between ammonium hydroxide and the styrene maleic anhydride copolymer" (5:21-23 and 6:41-42) and "after the reaction was complete" (5:23). Jannusch further teaches that up to a 5 molar excess of ammonium hydroxide may be employed in the imidization reaction (4:55-60).

Collectively, these teachings of Jannusch are deemed anticipatory in regards to the extent of imidization being at least 90% in some cases.

Claim 3: Jannusch further teaches that the molecular weight of the styrene maleic acid copolymer is 20,000 which falls into the claimed range of instant claim 2 (example I).

Claim 5: Jannusch further teaches a solid content of more than 25% (less than 75% water) (4:30-31 and 4:37-42).

Claim 16: Jannusch further teaches an aqueous coating composition for coating a product to be imprinted (7:19-21).

Claim 17: Jannusch further teaches that the aqueous coating further comprises starch additives (example I).

Claim 20: Jannusch further teaches a method for coating a surface by applying a polymer dispersion of instant claim 1 onto a surface to be printed (example I and 7:19-21).

Claim 21: Jannusch further teaches that the substrate is paper (7:19-21).

Claim 2 is rejected under 35 U.S.C. 102(b) as being anticipated by Jannusch (US Pat. 4,440,884) as evidenced by Mavis (US Pat. 4,243,564).

Jannusch teaches the aqueous polymer dispersion of instant claim 1, as described above. Jannusch further teaches the Lytron series (Monsanto) are suitable fortifying polymers (3:58-60). As evidenced by Mavis, Lytron 810 is a styrene-maleic anhydride copolymer having a 1:1 ratio of styrene and maleic acid monomer units (2:39-42). Therefore, Jannusch indirectly teaches the limitations of instant claim 2.

Claims 8-9 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Jannusch (US Pat. 4,440,884).

Claim 8: Jannusch teaches a method for the production of an aqueous polymer dispersion comprising the steps of: (1) reacting a starting copolymer of anhydride monomer units and vinyl monomer units in an aqueous solution of ammonia followed by, (2) subjecting the mixture to an imidization reaction (example I).

Claims 9 and 12-13: While Jannusch does not explicitly state that the imidization reaction proceeds at greater than 90% conversion, it is the position of the Office that this inherently occurs. Specifically, Jannusch repeatedly employs the phrase "to ensure the reaction between ammonium hydroxide and the styrene maleic anhydride copolymer" (5:21-23 and 6:41-42) and "after the reaction was complete" (5:23). Jannusch further teaches that up to a 5 molar excess of ammonium hydroxide may be employed in the imidization reaction (4:55-60). Collectively, these teachings of Jannusch are deemed anticipatory in regards to the extent of imidization being at least 90% in some cases.

Claim 11: Jannusch further teaches that the molecular weight of the styrene maleic acid copolymer is 20,000 which falls into the claimed range of instant claim 2 (example I).

Claim 14: Jannusch further teaches that the reactions are carried out with stirring (example I).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jannusch (US Pat. 4,440,884).

Jannusch further teaches that the reactions are carried out at 85 degrees C. While Jannusch does not teach carrying out the reaction at greater than 100 degrees C as in instant claim 15, the reaction temperature is a result-effective variable. The courts have stated that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (i.e., does not require undue experimentation). *In re Aller*, 105 USPQ 233. "Discovering an optimum value of a result effective variable involves only routine skill in the art." *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Note too MPEP 2144.05 which states that "differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art

unless there is evidence indicating such concentration or temperature is critical". In the instant case, it would have been obvious to a person having ordinary skill in the art to increase the reaction temperature in order to increase the reaction rates and thus decrease the overall reaction times.

Claims 1-7, 16-17 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Den Berg et al. (US Pat. 6,407,197).

Claim 1: Van Den Berg et al. teaches an aqueous polymer dispersion comprising a copolymer of anhydride monomer units and vinyl monomer units, in which the copolymer has been subjected to an imidization reaction (abstract). Van Den Berg et al. further teaches that at most 75% of the maleic anhydride monomer units have been imidized. However, in the Van Den Berg et al. teaching, a comparative example (which is designated as the current state of the art) is shown (Table 1) in which 89% of the anhydride groups have been imidized. A reference may be used in its entirety, including teachings which are not part of a claimed (patented) invention(s). As such, Van Den Berg et al. effectively teaches an aqueous polymer dispersion having 89% of the anhydride groups replaced by imide groups. While the degree of imidization does not exceed 89% as taught by Van Den Berg et al. the courts have stated that a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skill in the art would have expected then to have the same properties. *Titanium Metals Corp. of America v. Banner,* 778 F.2d 775 227 USPQ 773 (Fed. Cir. 1985). See MPEP 2144.05 (I). In the instant case, a poly(styrene-co-maleimide) dispersion having 89% of the anhydride groups imidized (as taught by Van Den Berg et al.) versus a poly(styrene-co-

maleimide) dispersion having, for example 90.1% of the anhydride groups imidized (as in instant claim 1), would suggest to a person having ordinary skill in the art that these two materials would be expected to have the same properties. A further suggestion comes from the Van Den Berg et al. teaching (Tables 1 and 2). Van Den Berg et al. explicitly teaches three poly(styrene-co-maleimide) copolymers having 59%, 65% and 89% imidization of the anhydride groups. The compositions of 59% and 65%, which have an even greater difference in range (6%), were shown to have substantially the same printing properties (Table 2).

Further, while Van Den Berg et al. teaches away from employing greater than 75% imidization, the courts have stated that, "a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including nonpreferred embodiments." *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied*, 493 U.S. 975 (1989).

Claims 2 and 7: Van Den Berg et al. further teaches that the starting polymer contains from 18-50 mol% of maleic anhydride units and 50-82 mol% of styrene monomer units (2:12-17), which partially overlap the claimed ranges of instant claim 2.

Claim 3: Van Den Berg et al. further teaches that the copolymer has a molecular weight ranging from 50,000 to 180,000 g/mol (2:17-19), which partially overlaps the claimed molecular weight range of instant claim 3.

Claim 4: Van Den Berg et al. further teaches that a variety of other monomer units can be employed; thus, the copolymer composition may comprise a plurality of copolymers having varying molecular weights (2:4-6).

Claim 5: Van Den Berg et al. further teaches that the dispersion has a solid content of more than 20 wt% (2:51-65). Specifically, the polymer dispersion typically is present at from 0.2 to 10 wt % and is further employed at from 2 to 6 wt% based on the dry weight of a starch additive, it inherently follows that the solid content can exceed 20 wt%.

Claim 6: Van Den Berg et al. does not explicitly teach that the particle size of the polymer dispersion. However, the particle size is a result-effective variable. The courts have stated that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (i.e., does not require undue experimentation). *In re Aller*, 105 USPQ 233. "Discovering an optimum value of a result effective variable involves only routine skill in the art." *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the instant case, a person having ordinary skill in the art would have found it obvious to employ polymer dispersions as taught by Van Den Berg et al. having particles sizes which encompass the claimed particle size range of instant claim 6 and would have been motivated to do so since large particles are prone to settling out and aggregation. Further, as a general rule, smaller particle sizes provide for increased stability of the resulting dispersion. Last, since Van Den Berg et al. further teaches the same process for producing the aqueous polymer dispersions (vide infra), it follows that the particle sizes produced fall within the applicant's claimed range.

Claim 16: Van Den Berg et al. further teaches coating a product to be imprinted (5:63-6:18).

Claim 17: Van Den Berg et al. further teaches the addition of further additives such as starch (2:54-55).

Claim 20: Van Den Berg et al. further teaches a method of coating a surface comprising applying the polymer dispersion of instant claim 1 to a surface (5:16-61).

Claim 21: Van Den Berg et al. further teaches that the surface is paper (5:59-61).

Claims 8 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Den Berg et al. (US Pat. 6,407,197).

Claim 8: Van Den Berg et al. teaches a method for the production of an aqueous polymer dispersion comprising the steps of: (1) reacting a starting copolymer of anhydride monomer units and vinyl monomer units in an aqueous solution of ammonia [or primary amine (2:41-43)] followed by, (2) subjecting the mixture to an imidization reaction (3:4-44). Van Den Berg et al., as a comparative example, teaches this process to prepare a poly(styrene-co-maleimide) dispersion having 89% of the anhydride groups imidized (table 1). A reference may be used in its entirety, including teachings which are not part of a claimed (patented) invention(s). As such, Van Den Berg et al. effectively teaches an aqueous polymer dispersion having 89% of the anhydride groups replaced by imide groups. While the degree of imidization does not exceed 89%, the courts have stated that a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skill in the art would have expected then to have the same properties. *Titanium Metals Corp. of America v. Banner,* 778 F.2d 775 227 USPQ 773 (Fed. Cir. 1985). See MPEP 2144.05 (I). In the instant case, a poly(styrene-co-maleimide) dispersion having 89% of the anhydride groups imidized (as taught by Van Den Berg et al.) versus a poly(styrene-co-maleimide) dispersion having, for example

90% of the anhydride groups imidized (as in instant claim 1), would suggest to a person having ordinary skill in the art that these two materials would be expected to have the same properties. A further suggestion comes from the Van Den Berg et al. teaching (Tables 1 and 2). Van Den Berg et al. explicitly teaches three poly(styrene-co-maleimide) copolymers having 59%, 65% and 89% imidization of the anhydride groups. The compositions of 59% and 65%, which have an even greater difference in range (6%), were shown to have substantially the same printing properties (Table 2).

Further, while Van Den Berg et al. appears to teach away from employing greater than 75% imidization, the courts have stated that, "a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including nonpreferred embodiments." *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied*, 493 U.S. 975 (1989).

Claim 11: Van Den Berg et al. further teaches that the molecular weight of the poly(styrene-co-maleimide) is from 50,000 to 180,000 g/mol (2:17-19), which partially overlaps the claimed molecular weight range of instant claim 11.

Claims 12 and 13: Van Den Berg et al. further teaches that the amine:anhydride ratio can be 1.5:1 to 2.5:1, respectively, which partially overlaps the ratios of instant claims 12 and 13 (2:38-43).

Claim 14: Van Den Berg et al. further teaches the method of instant claim 8 under conditions of stirring (3:10-12).

Claim 15: Van Den Berg et al. further teaches that the reaction temperature is between 100 and 130 degrees C (2:35-38).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Den Berg et al. (US Pat. 6,407,197), as applied to claim 8 above, further in view of Condo et al. (US Pat. 2,286,062).

Van Den Berg et al. teaches a method for the production of an aqueous polymer dispersion of instant claim 8, as described above. Van Den Berg et al. does not teach that the poly(styrene-co-maleimide) can be reacted in the presence of an alkali salt of an acid functional polymer containing acid functional groups. Stated another way, Van Den Berg et al. does not teach that the poly(styrene-co-maleic anhydride) can be a mixture of a partial salt of the hydrolysis product of the anhydride. However, Condo et al. does teach a poly(styrene-co-maleic anhydride) which is in the form of a partial alkali (sodium) salt of the hydrolysis product (example on page 2, left column, lines 24-32). Van Den Berg et al. and Condo et al. are combinable because they are from the same field of endeavor, namely, compositions comprising poly(styrene-co-maleic anhydride). At the time of the invention, a person having ordinary skill in the art would have found it obvious to employ the poly(styrene-co-maleic anhydride) starting material in the form of its partial sodium salt of the hydrolyzed copolymer and would have been motivated to do so because Condo et al. teaches that the partial sodium salt of the poly(styrene-co-maleic anhydride) hydrolyzed copolymer is an easily handled solid (example on page 2, left column lines 30-32), allowing for its ease of incorporation into further synthetic manipulations.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jannusch (US Pat. 4,440,884) as applied to claim 8 above, further in view of Condo et al. (US Pat. 2,286,062).

Jannusch et al. teaches a method for the production of an aqueous polymer dispersion of instant claim 8, as described above. Jannusch et al. does not teach that the poly(styrene-co-maleimide) can be reacted in the presence of an alkali salt of an acid functional polymer containing acid functional groups. Stated another way, Jannusch et al. does not teach that the poly(styrene-co-maleic anhydride) can be a mixture of a partial salt of the hydrolysis product of the anhydride. However, Condo et al. does teach a poly(styrene-co-maleic anhydride) which is in the form of a partial alkali (sodium) salt of the hydrolysis product (example on page 2, left column, lines 24-32). Jannusch et al. and Condo et al. are combinable because they are from the same field of endeavor, namely, compositions comprising poly(styrene-co-maleic anhydride). At the time of the invention, a person having ordinary skill in the art would have found it obvious to employ the poly(styrene-co-maleic anhydride) starting material in the form of its partial sodium salt as taught by Condo et al. into the process of Jannusch and would have been motivated to do so because Condo et al. teaches that the partial sodium salt of the poly(styrene-co-maleic anhydride) hydrolyzed copolymer is an easily handled solid (example on page 2, left column lines 30-32), allowing for its ease of incorporation into further synthetic manipulations.

Relevant Art Cited

The prior art made of record and not relied upon but is considered pertinent to applicants disclosure can be found on the attached PTO-892 form.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Loewe whose telephone number is (571) 270-3298. The examiner can normally be reached on Monday through Friday from 9:30 AM to 7:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571) 272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RSL
11-Dec-07

MARK EASHOO, PH.D.
SUPERVISORY PATENT EXAMINER
13/Dec/07